



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-1405; Project Identifier AD-2022-01070-E]

RIN 2120-AA64

Airworthiness Directives; CFM International, S.A. Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to supersede Airworthiness Directive (AD) 2021-10-09, which applies to all CFM International, S.A. (CFM) CFM56-5B and CFM56-7B model turbofan engines with a certain high-pressure turbine (HPT) inner stationary seal installed. AD 2021-10-09 requires removal, inspection, and replacement of the affected HPT inner stationary seal and, depending on the findings, replacement of the rotating air HPT front seal, HPT rotor blades, and No. 3 ball bearing. Since the FAA issued AD 2021-10-09, the manufacturer notified the FAA that the service information incorrectly lists the year of certain honeycomb repairs. Additionally, the manufacturer notified the FAA that affected HPT inner stationary seals could potentially be installed on CFM CFM56-5C model turbofan engines. This proposed AD would require removal, inspection, and replacement of the affected HPT inner stationary seal and, depending on the findings, replacement of the rotating air HPT front seal, HPT rotor blades, and No. 3 ball bearing. This proposed AD would also revise the applicability to add CFM CFM56-5C model turbofan engines. The FAA is proposing this AD to address the unsafe condition on these products.

DATES: The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to [regulations.gov](https://www.regulations.gov). Follow the instructions for submitting comments.

- Fax: (202) 493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) by searching for and locating Docket No. FAA-2022-1405; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, any comments received, and other information. The street address for Docket Operations is listed above.

Material Incorporated by Reference:

- For CFM service information identified in this NPRM, contact CFM International Inc., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: (877) 432-3272; email: aviation.fleetsupport@ge.com.

- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

FOR FURTHER INFORMATION CONTACT: Kevin Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7088; email: kevin.m.clark@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include “Docket No. FAA-2022-1405; Project Identifier AD-2022-01070-E” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend the proposal because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to regulations.gov, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Kevin Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

The FAA issued AD 2021-10-09, Amendment 39-21542 (86 FR 27264, May 20, 2021) (AD 2021-10-09), for all CFM CFM56-5B and CFM56-7B model turbofan engines with an HPT inner stationary seal, part number (P/N) 1808M56G01, installed. AD 2021-10-09 was prompted by cracks found in the rotating air HPT front seal. After investigation, CFM determined that the HPT inner stationary seal, P/N 1808M56G01, may not have received the correct braze heat treat cycle at the time of the honeycomb replacement. As a result, the affected HPT inner stationary seal may have a condition that could lead to a localized separation of the replaced honeycomb, which may reduce the life of the rotating air HPT front seal. AD 2021-10-09 requires removal, inspection, and replacement of the affected HPT inner stationary seal and, depending on the findings, replacement of the rotating air HPT front seal, HPT rotor blades, and No. 3 ball bearing.

The agency issued AD 2021-10-09 to prevent failure of the HPT inner stationary seal and the rotating air HPT front seal, which could result in uncontained release of the rotating air HPT front seal, damage to the engine, and damage to the airplane.

Actions Since AD 2021-10-09 Was Issued

Since the FAA issued AD 2021-10-09, the manufacturer notified the FAA that the service information, which is incorporated by reference, incorrectly lists the year of certain honeycomb repairs. The manufacturer subsequently published revised service information that establishes a single date for the honeycomb repairs. Additionally, the manufacturer notified the FAA that affected HPT inner stationary seals could be installed on CFM CFM56-5C model turbofan engines. The FAA, therefore, determined that the unsafe condition is likely to exist or develop on CFM CFM56-5C model turbofan engines with an affected HPT inner stationary seal installed.

FAA's Determination

The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop on other products of the same type design.

Related Service Information under 1 CFR Part 51

The FAA reviewed the following service information:

- CFM Service Bulletin (SB) CFM56-5C S/B 72-0796, Revision 02, dated August 10, 2022.
- CFM SB CFM56-5B S/B 72-0952, Revision 02, dated August 10, 2022.
- CFM SB CFM56-7B S/B 72-1054, Revision 02, dated August 10, 2022.

This service information, differentiated by engine model, specifies procedures for inspecting the HPT inner stationary seal honeycomb. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

Proposed AD Requirements in this NPRM

This proposed AD would retain none of the requirements of AD 2021-10-09. This proposed AD would require removal, inspection, and replacement of the affected HPT inner stationary seal and, depending on the findings, replacement of the rotating air HPT

front seal, HPT rotor blades, and No. 3 ball bearing. This proposed AD would also revise the applicability to add CFM CFM56-5C model turbofan engines.

Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 210 engines installed on airplanes of U.S. registry. Operators have the option to replace or repair the affected HPT inner stationary seal. The parts cost includes the estimated costs for replacement with a repaired HPT inner stationary seal.

The FAA estimates the following costs to comply with this proposed AD:

Estimated costs

Action	Labor Cost	Parts Cost	Cost per Product	Cost on U.S. Operators
Replace HPT inner stationary seal	1 work-hour x \$85 per hour = \$85	\$7,910	\$7,995	\$1,678,950
Inspect HPT inner stationary seal	1 work-hour x \$85 per hour = \$85	\$0	\$85	\$17,850

The FAA estimates the following costs to do any necessary replacements that would be required based on the results of the proposed inspection. The agency has no way of determining the number of engines that might need these replacements:

On-condition costs

Action	Labor Cost	Parts Cost	Cost per Product
Replace rotating air HPT front seal	1 work-hour x \$85 per hour = \$85	\$344,600	\$344,685
Replace HPT rotor blades (pair)	1 work-hour x \$85 per hour = \$85	\$31,000	\$31,085
Replace No. 3 ball bearing	1 work-hour x \$85 per hour = \$85	\$30,000	\$30,085

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that the proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

- 2. The FAA amends § 39.13 by:

- a. Removing Airworthiness Directive 2021-10-09, Amendment 39-21542

(86 FR 27264, May 20, 2021); and

b. Adding the following new airworthiness directive:

CFM International, S.A.: Docket No. FAA-2022-1405; Project Identifier AD-2022-01070-E.

(a) Comments Due Date

The FAA must receive comments on this airworthiness directive (AD) action by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

This AD replaces AD 2021-10-09, Amendment 39-21542 (86 FR 27264, May 20, 2021) (AD 2021-10-09).

(c) Applicability

This AD applies to CFM International, S.A. (CFM) model turbofan engines identified in Table 1 to paragraph (c) of this AD with an installed high-pressure turbine (HPT) inner stationary seal, part number (P/N) 1808M56G01, that has a serial number (S/N) listed in Table 1 of CFM Service Bulletin (SB) CFM56-5B S/B 72-0952, Revision 02, dated August 10, 2022 (CFM SB CFM56-5B S/B 72-0952); Table 1 of CFM SB CFM56-5C S/B 72-0796, Revision 02, dated August 10, 2022 (CFM SB CFM56-5C S/B 72-0796); or Table 1 of CFM SB CFM56-7B S/B 72-1054, Revision 02, dated August 10, 2022 (CFM SB CFM56-7B S/B 72-1054).

Table 1 to Paragraph (c) – CFM Model Turbofan Engines

Make	Model
CFM	CFM56-5B1, CFM56-5B1/2P, CFM56-5B1/3, CFM56-5B1/P, CFM56-5B2, CFM56-5B2/2P, CFM56-5B2/3, CFM56-5B2/P, CFM56-5B3/2P, CFM56-5B3/2P1, CFM56-5B3/3, CFM56-5B3/3B1, CFM56-5B3/P, CFM56-5B3/P1, CFM56-5B4, CFM56-5B4/2P, CFM56-5B4/2P1, CFM56-5B4/3, CFM56-5B4/3B1, CFM56-5B4/P, CFM56-5B4/P1, CFM56-5B5, CFM56-5B5/3, CFM56-5B5/P, CFM56-5B6, CFM56-5B6/2P, CFM56-5B6/3, CFM56-5B6/P, CFM56-5B7, CFM56-5B7/3, CFM56-5B7/P, CFM56-5B8/3, CFM56-5B8/P, CFM56-5B9/2P, CFM56-5B9/3, CFM56-5B9/P
CFM	CFM56-5C2, CFM56-5C2/4, CFM56-5C2/F, CFM56-5C2/F4, CFM56-5C2/G, CFM56-5C2/G4, CFM56-5C2/P, CFM56-5C3/F, CFM56-5C3/F4, CFM56-5C3/G, CFM56-5C3/G4, CFM56-5C3/P, CFM56-5C4, CFM56-5C4/1, CFM56-5C4/1P, CFM56-5C4/P
CFM	CFM56-7B20, CFM56-7B20/2, CFM56-7B20/3, CFM56-7B20E, CFM56-7B22, CFM56-7B22/2, CFM56-7B22/3, CFM56-7B22/3B1, CFM56-7B22/B1, CFM56-7B22E, CFM56-7B22E/B1, CFM56-7B24, CFM56-7B24/2, CFM56-7B24/3, CFM56-7B24/3B1, CFM56-7B24/B1, CFM56-7B24E, CFM56-7B24E/B1, CFM56-7B26, CFM56-7B26/2, CFM56-7B26/3, CFM56-7B26/3B1, CFM56-7B26/3B2, CFM56-7B26/3B2F, CFM56-7B26/3F, CFM56-7B26/B1, CFM56-7B26/B2, CFM56-7B26E, CFM56-7B26E/B1, CFM56-7B26E/B2, CFM56-7B26E/B2F, CFM56-7B26E/F, CFM56-7B27, CFM56-7B27/2, CFM56-7B27/3, CFM56-7B27/3B1, CFM56-7B27/3B1F, CFM56-7B27/3B3, CFM56-7B27/3F, CFM56-7B27/B1, CFM56-7B27/B3, CFM56-7B27A, CFM56-7B27A/3, CFM56-7B27AE, CFM56-7B27E, CFM56-7B27E/B1, CFM56-7B27E/B1F, CFM56-7B27E/B3, CFM56-7B27E/F

(d) Subject

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section.

(e) Unsafe Condition

This AD was prompted by cracks found in the rotating air HPT front seal. The FAA is issuing this AD to prevent failure of the HPT inner stationary seal and the rotating air HPT front seal. The unsafe condition, if not addressed, could result in uncontained release of the rotating air HPT front seal, damage to the engine, and damage to the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) At the next engine shop visit after the effective date of this AD, remove the affected HPT inner stationary seal and replace with an HPT inner stationary seal that is eligible for installation.

(2) After removing the affected HPT inner stationary seal required by paragraph (g)(1) of this AD, inspect the removed HPT inner stationary seal for honeycomb separation in accordance with the Accomplishment Instructions, paragraph 3.C.(1), of CFM SB CFM56-5B S/B 72-0952; CFM SB CFM56-5C S/B 72-0796; or CFM SB CFM56-7B S/B 72-1054, as applicable by engine model.

(3) If honeycomb separation is found during the inspection required by paragraph (g)(2) of this AD, before further flight:

(i) Remove the rotating air HPT front seal from service and replace with a rotating air HPT front seal that is eligible for installation.

(ii) Remove the HPT rotor blades and replace with HPT rotor blades eligible for installation.

(iii) Remove the No. 3 ball bearing from service and replace with a No. 3 ball bearing eligible for installation.

(h) Definitions

(1) For the purpose of this AD, an “engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine case flanges, except for the following situations, which do not constitute an engine shop visit.

(i) Separation of engine flanges solely for the purpose of transportation of the engine without subsequent maintenance.

(ii) Separation of engine flanges solely for the purpose of replacing the fan or propulsor without subsequent maintenance.

(2) For the purpose of this AD, an “HPT inner stationary seal that is eligible for installation” is an HPT inner stationary seal:

(i) That is not listed in Table 1 of CFM SB CFM56-5B S/B 72-0952; Table 1 of CFM SB CFM56-5C S/B 72-0796; or Table 1 CFM SB CFM56-7B S/B 72-1054; or

(ii) With a P/N 1808M56G01 and an S/N listed in Table 1 of CFM SB CFM56-5B S/B 72-0952; Table 1 of CFM SB CFM56-5C S/B 72-0796; or Table 1 of CFM SB CFM56-7B S/B 72-1054, that has been repaired as specified in CFM56-5B ESM, 72-41-03, REPAIR 003; CFM56-5C ESM, 72-41-03, REPAIR 003; or CFM56-7B ESM, 72-41-03, REPAIR 003, as applicable by engine model, after December 31, 2012.

(3) For the purpose of this AD, a “rotating air HPT front seal that is eligible for installation” is any rotating air HPT front seal that was not removed from service as a result of the inspection of the HPT inner stationary seal required by paragraph (g)(2) of this AD in which there was a finding of honeycomb separation.

(4) For the purpose of this AD, “HPT rotor blades eligible for installation” are new HPT rotor blades with zero flight hours since new or HPT rotor blades that have been inspected and returned to a serviceable condition using FAA-approved maintenance procedures.

(5) For the purpose of this AD, a “No. 3 ball bearing eligible for installation” is any No. 3 ball bearing that was not removed from service as a result of the inspection of the HPT inner stationary seal required by paragraph (g)(2) of this AD in which there was a finding of honeycomb separation.

(i) Credit for Previous Actions

You may take credit for the actions specified in paragraphs (g)(1) through (3) of this AD, if you performed those actions before the effective date of this AD using CFM SB CFM56-5B S/B 72-0952, Revision 01, dated January 15, 2020, CFM SB CFM56-7B S/B 72-1054, Revision 01, dated January 15, 2020, or CFM SB CFM56-5C S/B 72-0796 Revision 01, dated January 15, 2020.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (k)(1) of this AD and email to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(3) AMOCs approved for AD 2021-10-09 (86 FR 27264, May 20, 2021) are approved as AMOCs for the corresponding provisions of this AD.

(k) Related Information

(1) For more information about this AD, contact Kevin Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7088; email: kevin.m.clark@faa.gov.

(2) Service information identified in this AD that is not incorporated by reference is available at the addresses specified in paragraphs (1)(3) and (4) of this AD.

(l) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) CFM Service Bulletin (SB) CFM56-5C S/B 72-0796, Revision 02, dated August 10, 2022.

(ii) CFM SB CFM56-5B S/B 72-0952, Revision 02, dated August 10, 2022.

(iii) CFM SB CFM56-7B S/B 72-1054, Revision 02, dated August 10, 2022.

(3) For CFM service information identified in this AD, contact CFM International Inc., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: (877) 432-3272; email: aviation.fleetsupport@ge.com.

(4) You may view this service information at FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the

availability of this material at NARA, email: fr.inspection@nara.gov, or go to:
www.archives.gov/federal-register/cfr/ibr-locations.html.

Issued on October 27, 2022.

Christina Underwood, Acting Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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